10/501962

# 170 Sequence Listing.ST25 SEQUENCE LISTING

<110>	Braun, Klaus Braun, Isabell Debus, Jürgen Pipkorn, Rüdiger Waldeck, Waldemar	
<120>	CONJUGATE FOR TREATING PROKARYOTIC INFECTIONS	
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caccgt	tcacc ctggatgctg taggcatagg cttggttatg ccggtactgc cgggcctctt	180
gcgggatatc gtccattccg acagcatcgc cagtcactat ggcgtgctgc tagcgctata		240
tgcgttgatg caatttctat gcgcacccgt tctcggagca ctgtccgacc gctttggccg		300
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Arg Gln Ser Gly Asn Leu Leu Gly Leu Val Thr Glu Ile Phe Val Ala 35 40 45			
Val Thr Ala Gly Ala Val Ala Tyr Leu Leu Gly Gln His Glu Gly Trp 50 55 60			
Glu Leu Ser Ile Thr Tyr Leu Met Val Thr Ile Ala Ser Asn Asn Gly 65 70 80			
His Glu Val Ile Ser Gly Met Lys Arg Val Asn Ile Asp Ser Ile Leu 85 90 95			
Asn Val Leu Thr Ser Leu Val Lys Lys Gly Gly Gly Lys 100 105			
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Thr Gly Tyr Trp Leu Leu Gln Leu Leu Asp Lys Val Ser Pro Ser Gln 20 30			
Trp Val Ala Ile Gly Val Leu Gly Ser Leu Leu Phe Gly Leu Leu Thr 35 40			
Tyr Leu Thr Asn Leu Tyr Phe Lys Ile Arg Glu Asp Arg Arg Lys Ala 50 60			
Val Arg Gly Glu 65			

<210> 6

<211> 96

<213> Bacteriophage A118

<400> 6

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Leu Val Val Val Thr Pro Val Phe Val Gln Ala Ile Lys Lys Thr Glu 20 25 30

Leu Val Pro Ser Lys Trp Leu Pro Thr Val Ser Ile Leu Ile Gly Ala 35 40 45

Ile Leu Gly Ala Leu Ala Thr Phe Leu Asp Gly Ser Gly Ser Leu Ala  $50 \hspace{1.5cm} 55 \hspace{1.5cm} 60$ 

Thr Met Ile Trp Ala Gly Ala Leu Ala Gly Ala Gly Gly Thr Gly Leu 65 70 75 80

Phe Glu Gln Phe Thr Asn Arg Ser Lys Lys Tyr Gly Glu Asp Asp Lys  $85 \hspace{1cm} 90 \hspace{1cm} 95$ 

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<213> Lactobacillus casei bacteriophage A2

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Ala Leu Val Pro Ala Ala Leu Leu Val Val Gln Thr Ala Ala Ala Val 20 25 30

Phe Gly Tyr Asn Trp Asp Phe Ala Asn Leu Gly Lys Glu Leu Thr Ala 35 40 45

Val Ile Asn Ala Val Phe Ala Leu Leu Thr Ile Val Gly Val Ala Val 50 60

Asp Pro Thr Thr Glu Gly Val Ser Asp Ser Gln Gln Ala Leu Ala Tyr 65 70 75 80

Pro Ala Leu Ile Thr Thr Lys Ala Ala Lys Ile Lys Ser Leu Glu Asp 85 90 95

Gln Ile Lys Ala Leu Gln Ala Asp Lys Ala Ala Asp Gln Ala Thr Ser 100 105 110

Ala Ala Ser Glu Val Val Pro Glu Thr Ser Ser Ala Ala Pro Ala Glu 115 120 125

Ser Ala Pro Glu Ser Val Ala Pro Val Ala Ser Glu Glu Val Lys 130 135 140

<210> 8

<211> 142

<212> PR1

<213> Lactobacillus bacteriophage phig 1e

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Leu Ile Ser Phe Phe Ile Gly Val Ile Val Gln Ala Ile Lys Lys Thr  $20 \hspace{1.5cm} 25 \hspace{1.5cm} 30$ 

Gly Lys Val Lys Asn Thr Tyr Leu Pro Phe Ile Ser Met Gly Ile Gly 35 40 45

Ile Leu Ala Gly Leu Ala Ala Val Val Thr Lys Asp Thr Asn Tyr 50 60

Leu Asn Gly Ala Val Ala Gly Leu Ile Val Gly Ala Ala Thr Ser Gly 65 70 75 80

Leu Thr Asp Gly Leu Ser Val Gly Thr Ser Ala Val Thr Thr Ala Lys 85 90 95

Ala Thr Lys Asp Ala Ala Lys Thr Ala Ala Ile Thr Gln Ala Val Leu  $100 \hspace{1.5cm} 105 \hspace{1.5cm} 110$ 

Asn Ser Ile Asn Thr Thr Lys Ser Ser Asp Thr Thr Gln Val Ala Asn 115 120 125

Thr Ser Asn Thr Glu Gly Gly Ser Thr Ser Glu Thr Gln Lys 130 135 140

<210> 9

<211> 107 <212> PRT

<213> Lactobacillus delbrueckii subsp. lactis bacteriophage LL-H

<400> 9

Met Thr Leu Ile Asp Trp Phe Asn Leu Ile Val Ala Ile Gly Thr Ile  $1 \ 5 \ 10 \ 15$ 

Ala Leu Ala Val Val Ala Ser Val Tyr Val His Leu Lys Ala Lys Ile 20 25 30

Asp Thr Lys Thr Ala Ala Gly Lys Ala Phe Asp Leu Val Gly Lys Leu  $35 \hspace{1cm} 40 \hspace{1cm} 45$ 

Ala Val Trp Ala Val Asn Glu Ala Glu His Ser Gln Asp Gly Gly Ala 50 60

Ala Lys Arg Glu Phe Ala Ala Lys Leu Ile Ser Asp Gln Leu Lys Ala 65 70 75 80

Lys Gly Ile Thr Gly Ile Asp Glu Lys Met Val Tyr Gly Ala Val Glu  $85 \hspace{1.5cm} 90 \hspace{1.5cm} 95$ 

Thr Ala Trp Lys Glu Ala Ile Glu Asn Val Lys  $100 \hspace{1cm} 105$ 

<210> 10

<211> 44 <212> PRT

<213> Lactococcus phage c2

<400> 10

Met Ile Glu Thr Leu Arg Ala Ile Gly Leu Val Val Phe Met Gln Leu  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Leu Ser Leu Ala Leu Glu Phe Ile Asp Thr Gly Thr Leu Lys Pro Ser  $20 \hspace{1cm} 25 \hspace{1cm} 30$ 

Val Arg Lys Arg Ile Ala Val Glu Leu Met Val Leu 35 40

<210> 11

<211> 74

<212> PRT

<213> bacteriophage phi AM2

<400> 11

Met Phe Phe Asn Asn Lys Phe Tyr Asn Val Ile Lys Trp Ala Val Leu  $1 \hspace{1cm} 10 \hspace{1cm} 15$ 

Thr Ala Leu Pro Ala Leu Ser Val Phe Ile Gly Val Ile Gly Lys Ala 20 25 30

Tyr Gly Trp Gly Gly Thr Asp Leu Ala Ile Ile Thr Leu Asn Ala Phe 35 40 45

Thr Val Phe Leu Gly Thr Leu Ala Gly Val Ser Ala Val Lys Tyr Asn 50 60

Ser Gln Pro Asn Asp Thr Lys Glu Asn Lys 65 70

<210> 12

<211> 88

<212> PRT

<213> Bacteriophage Tuc2009

<400> 12

Met Asn Gln Ile Asn Trp Lys Leu Arg Leu Lys Ser Lys Ala Phe Trp  $1 \hspace{1cm} 15$ 

170 Sequence Listing.ST25
Leu Ala Leu Leu Pro Ala Leu Phe Leu Leu Ile Gln Ala Ile Gly Ala
20 25 30

Pro Phe Gly Tyr Lys Trp Asp Phe Val Ile Leu Asn Gln Gln Leu Ala 35 40 45

Ala Val Val Asn Ala Ala Phe Ala Leu Leu Ala Ile Val Gly Val Val 50 60

Ala Asp Pro Thr Thr Ser Gly Leu Gly Asp Ser Asp Arg Val Leu Asn 65 70 75 80

Lys Asp Lys Ser Glu Glu Asn Lys 85

<210> 13

<211> 88

<212> PRT

<213> Bacteriophage TPW22

<400> 13

Met Asn Gln Ile Asn Trp Lys Leu Arg Leu Lys Ser Lys Ala Phe Trp 1 15

Ser Phe Gly Tyr Lys Trp Asn Phe Val Ile Leu Asn Gln Gln Leu Ala  $\frac{35}{40}$ 

Ala Val Val Asn Ala Ala Phe Ala Leu Leu Ala Ile Val Gly Val Val 50 60

Ala Asp Pro Thr Thr Ser Gly Leu Gly Asp Ser Asp Arg Val Leu Asn 65 70 75

Lys Asp Lys Ser Glu Glu Asn Lys 85

<210> 14

<211> 74

<212> PRT

<213> homology to Orf78 of phage HP1 and gene S of phage P21

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Met Arg Phe Asn Met Leu Lys Asn Ser Glu Thr Thr Gly Ala Tyr Val  $1 \hspace{1cm} 5 \hspace{1cm} 15$ 

Gly Ser Ala Ile Ala Ile Tyr Ser Gly Phe Thr Leu Ala Asp Trp Ala 20 25 30

Ala Ile Phe Gly Ile Leu Phe Gly Leu Phe Thr Met Leu Ile Asn Trp 35 40 45

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Tyr Tyr Lys Asn Lys Glu Ile Lys Leu Lys Glu Thr Ala Leu Lys Gln 50 55 60
Lys Ile Asp Leu Lys Glu Gly Asp His Glu 65 70
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         Bacillus phage GA-1
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Met Phe Glu Phe Phe His Ser Leu Met Glu Thr Asp Asp Thr Lys Val 1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15
Tyr Phe Leu Leu Gly Ile Ile Gly Val Leu Asn Ile Val Asp Phe Phe 20 30
Phe Gly Phe Ile Asn Ala Lys Phe Asn Lys Ser Ile Ala Tyr Lys Ser 35 40 45
Ser Lys Thr Ile Asp Gly Ile Met Arg Lys Met Lys Phe Thr Ile Met 50 60
Ala Ile Leu Phe Ile Pro Val Ser Val Leu Met Pro Glu Pro Ile Gly 70 75
Leu Gly Ala Leu Tyr Val Phe Tyr Phe Gly Tyr Ile Tyr Ala Glu Leu
85 90 95
Asn Ser Ile Leu Ser His Leu Lys Leu Ser Glu Asp Gly Lys Glu Thr 100 \hspace{1cm} 105 \hspace{1cm} 110
Glu Val Phe Leu Asp Phe Ile Asn Thr Phe Phe Asn Ser Thr Lys Gly 115 120
Asp Lys Lys Asp Asp 130
<210>
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       PRT
        Staphylococcus phage 187
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Met Leu Met Val Ile Met Val Gly Asn Val Gly Ile Tyr Leu Thr Ile 1 \hspace{1cm} 15
Phe Leu Ile Asp Thr Gly Thr Leu Arg His Gln Ala Thr Gln Glu Ile 20 \hspace{1cm} 25 \hspace{1cm} 30
Trp His Gly Ile Asp Ile Leu Lys Gly Leu Lys Cys Leu Glu Thr Leu 35 40 45
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Page 7

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170 Sequence Listing.ST25
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<213> Shigella dysenteriae
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Pro Ser Gln Trp Ala Ala Ile Gly Val Leu Gly Ser Leu Leu Phe Gly 35 40
Leu Leu Thr Tyr Leu Thr Asn Leu Tyr Phe Lys Ile Arg Glu Asp Arg 50 55 60
Arg Lys Ala Ala Arg Gly Glu
65 70
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Ser Leu Leu Pro Ser Leu Leu Ile Met Phe Ile Pro Ser Met Tyr 20 \hspace{1.5cm} 25 \hspace{1.5cm} 30
Lys Gln His Ala Ser Leu Trp Lys Ala Arg Ser Leu Ala Lys Thr Leu 35 40
Ser Met Ala Ser Ser Ala Arg Leu Thr Pro Leu Ser Ser Ser Arg Thr 50 \\ \hspace{1.5cm} 55 \\ \hspace{1.5cm} 60
Pro Cys Val Leu Lys Gln Asp Ser Lys Lys Leu
65 70 75
<210>
        19
<211>
        87
        PRT
        B.subtilis
<213>
<400>
Met Asn Thr Phe Asp Lys Gly Thr Val Ile Arg Thr Val Leu Leu 1 5 15
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Page 8

Ile Ala Leu Ile Asn Gln Thr Met Leu Met Leu Gly Lys Ser Pro Leu  $20 \hspace{1cm} 25 \hspace{1cm} 30$ 

Asp Ile Gln Glu Gln Val Asp Gln Leu Ala Asp Ala Leu Tyr Ser 35 40 45

Ala Gly Ser Ile Ala Phe Thr Ile Gly Thr Thr Leu Ala Ala Trp Phe  $50 \hspace{1.5cm} 60$ 

Lys Asn Asn Tyr Val Thr Glu Lys Gly Lys Lys Gln Arg Asp Leu Leu 65 70 75 80

Arg Asp Asn Asn Leu Thr Lys 85

<210> 20

<211> 70

<213> Bacillus subtilis 168 prophage

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Val Leu Phe Cys Trp Leu Leu Phe Tyr Val Met Lys Thr Ser Lys Glu 20 25 30

Arg Glu Ser Lys Leu Tyr Asn Gln Ile Asp Ser Gln Asn Glu Val Leu 35 40 45

Gly Lys Phe Ser Glu Lys Tyr Asp Val Val Ile Glu Lys Leu Asp Lys 50 60

Ile Glu Gln Asn Phe Lys 65 70

<210> 21

<211> 88

<212> PRT

<213> Bacillus subtilis 168 prophage

<400> 21

Met Phe Glu Asn Ile Asp Lys Gly Thr Ile Val Arg Thr Leu Leu Leu  $1 \ 5 \ 10 \ 15$ 

Ala Ile Ala Leu Leu Asn Gln Ile Met Val Met Leu Gly Lys Ala Ala  $20 \hspace{1cm} 25 \hspace{1cm} 30$ 

Phe Ile Ile Asn Glu Glu Asp Ile Asn His Leu Tyr Asp Cys Leu Tyr 35 40 45

Thr Ile Phe Thr Ile Val Phe Thr Thr Ser Thr Thr Ala Ala Trp 50 60 Page 9

Phe Lys Asn Asn Tyr Ile Thr Ala Lys Gly Lys Lys Gln Lys Gln Val 65 70 75 80

Leu Lys Lys Glu Asn Leu Phe Lys 85

<210> 22

<211> 119

<212> PRT

<213> Bacteriophage phi-Ealh

<400> 22

Met Arg Lys Ile Tyr Val Val Ile Ile Thr Thr Ile Val Val Ala Gly  $1 \hspace{1cm} 10 \hspace{1cm} 15$ 

Leu Ile Trp Ala Phe Ile Ala Thr Gln Val Asn Thr Gly Val Thr Ser 20 25 30

Lys Arg Gln Glu Asp Ala Leu Ala Val Ser Glu Ala Asn Val Gly Ile 35 40 45

Gly Lys Glu Ala Lys Asp Gln Gly Glu Gln Ala Thr Lys Arg Ala Asp 50 60

Val Ala Lys Glu Gln Arg Thr His Gln Ile Asn Gln Leu Lys Asp Lys 65 70 75

Leu His Glu Lys Ala Glu Ser Tyr Asp Ser Ile Pro Leu Ser Pro Ser 85 90 95

Asp Val Asp Ile Leu Cys Arg Ala Tyr Arg Ser Thr Asp Pro Val Cys  $100 \hspace{1cm} 105 \hspace{1cm} 110$ 

Ser Pro Thr Val Lys Ser Asp 115

<210> 23

<211> 91

<212> PRT

<213> Phage phiX174

<400> 23

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Ser Leu Leu Pro Ser Leu Leu Ile Met Phe Ile Pro Ser Thr Phe  $20 \hspace{1cm} 25 \hspace{1cm} 30 \hspace{1cm}$ 

Lys Arg Pro Val Ser Ser Trp Lys Ala Leu Asn Leu Arg Lys Thr Leu  $35 \hspace{1.5cm} 40 \hspace{1.5cm} 45$ 

Leu Met Ala Ser Ser Val Arg Leu Lys Pro Leu Asn Cys Ser Arg Leu 50 60 Page 10

Pro Cys Val Tyr Ala Gln Glu Thr Leu Thr Phe Leu Leu Thr Gln Lys
65 70 75 80

Lys Thr Cys Val Lys Asn Tyr Val Gln Lys Glu 85 90

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<211> 109

<212>

<213> Artificial Sequence

<220> <223> Synthetic Construct

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Ala Leu Ile Arg Glu Gln Ala Ile Gly Ala Gly Leu Ala Ala Trp Met  $20 \hspace{1cm} 25 \hspace{1cm} 30 \hspace{1cm}$ 

Thr Cys Leu Arg Gly Arg Tyr Leu Gly Arg Gly Trp Arg Lys Thr Thr  $35 \hspace{1cm} 40 \hspace{1cm} 45 \hspace{1cm}$ 

Phe Asp Ala Ala Ile Cys Ala Leu Ile Ala Trp Phe Ala Arg Asp Gly 50 60

Leu Ala Leu Val Gly Ile Asp Asn Gln Phe Ser Tyr Leu Ser Ser Ile 65 70 75

Ile Val Gly Tyr Leu Gly Asn Asp Tyr Leu Gly Alá Leu Leu Arg Arg 85 90 95

Arg Leu Glu Lys Lys Ser Gly Glu Ser Asn Ala Pro Gln 100

25 95 <210>

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PRT

<213> Listeria innocua

Met Met Lys Met Glu Phe Gly Lys Glu Leu Leu Val Tyr Met Thr Phe  $1 \hspace{1cm} 15$ 

Leu Val Val Val Thr Pro Val Phe Val Gln Ala Ile Lys Lys Thr Glu

Leu Ile Pro Ser Lys Trp Leu Pro Thr Val Ser Ile Leu Val Gly Ala  $35 \hspace{1.5cm} 40 \hspace{1.5cm} 45$ 

Ile Leu Gly Ala Leu Ala Thr Ser Leu Asp Gly Ser Gly Ser Leu Ala  $50 \hspace{1.5cm} 55$ 

Thr Met Ile Trp Ala Gly Ala Leu Ala Gly Ala Gly Gly Thr Gly Leu 65 70 75

Phe Glu Gln Phe Thr Asn Arg Ala Lys Lys Tyr Gly Lys Asp Asp 85 90 95

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145

PRT Bacteriophage 80 alpha

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Met Asp Ile Asn Trp Lys Leu Arg Phe Lys Asn Lys Ala Val Leu Thr 1 10 15

Gly Leu Val Gly Ala Leu Phe Val Phe Ile Lys Gln Val Thr Asp Leu 20 25 30

Phe Gly Leu Asp Leu Ser Thr Gln Leu Asn Gln Ala Ser Ala Ile Ile 35 40 45

Gly Ala Ile Leu Thr Leu Leu Thr Gly Ile Gly Val Ile Thr Asp Pro 50 60

Thr Ser Lys Gly Val Ser Asp Ser Ser Ile Ala Gln Thr Tyr Gln Ala 65 70 80

Pro Arg Asp Ser Lys Lys Glu Glu Gln Gln Val Thr Trp Lys Ser Ser 85 90 95

Gln Asp Ser Ser Leu Thr Pro Glu Leu Ser Ala Lys Ala Pro Lys Glu  $100 ext{ } 105 ext{ } 110$ 

Tyr Asp Thr Ser Gln Pro Phe Thr Asp Ala Ser Asn Asp Val Gly Phe 115 120 125

Asp Val Asn Glu Tyr His His Gly Gly Gly Asp Asn Ala Ser Lys Ile 130 135 140

Asn 145

<210> 27

145 <211>

<213> Staphylococcus bacteriophage phi 11

<400> 27

Met Asp Ile Asn Trp Lys Leu Arg Phe Lys Asn Lys Ala Val Leu Thr 1 10 15

Gly Leu Val Gly Ala Leu Phe Val Phe Ile Lys Gln Val Thr Asp Leu 20 25 30

170 Sequence Listing.ST25 Phe Gly Leu Asp Leu Ser Thr Gln Leu Asn Gln Ala Ser Ala Ile Ile 35 40 45 Gly Ala Ile Leu Thr Leu Leu Thr Gly Ile Gly Val Ile Thr Asp Pro 50 60 Thr Ser Lys Gly Val Ser Asp Ser Ser Ile Ala Gln Thr Tyr Gln Ala 65 70 80 Pro Arg Asp Ser Lys Lys Glu Glu Gln Gln Val Thr Trp Lys Ser Ser 85 90 95 Gln Asp Ser Ser Leu Thr Pro Glu Leu Ser Ala Lys Ala Pro Lys Glu  $100 \hspace{1cm} 105 \hspace{1cm} 110$ Tyr Asp Thr Ser Gln Pro Phe Thr Asp Ala Ser Asn Asp Val Gly Phe 115 120 125Val Asn Glu Tyr His His Gly Gly Gly Asp Asn Ala Ser Lys Ile 130 135 140 Asn 145 <210> 28 <211> 138 <212> <213> Streptococcus pneumoniae bacteriophage MM1

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Asp Gly Leu Val Leu Tyr Ala Leu Ala Leu Ile Val Ser Met Glu Ile 20 25 30

Ile Asp Phe Val Thr Gly Thr Ile Ala Ala Ile Ile Asn Pro Asp Ile 35 40 45

Glu Tyr Lys Ser Lys Ile Gly Ile Asn Gly Leu Leu Arg Lys Ile Ser  $50 \ \ \, 55 \ \ \, 60$ 

Gly Val Leu Leu Met Ile Leu Ile Pro Ala Ser Val Leu Leu Pro 65 70 75

Glu Lys Thr Gly Phe Ala Phe Leu Tyr Ser Ile Cys Leu Gly Tyr Ile  $85 \hspace{1cm} 90 \hspace{1cm} 95$ 

Ala Phe Thr Phe Gln Ser Leu Ile Glu Asn Tyr Arg Lys Leu Lys Gly  $100 \hspace{1cm} 105 \hspace{1cm} 110$ 

Asn Val Thr Leu Phe Gln Pro Ile Val Lys Val Phe Gln Arg Leu Leu 115 120 125 Page 13

Glu Lys Asp Asp Asp Thr Lys Lys Gly Glu 130

<210> 29

<211> 86

<213> Streptococcus thermophilus bacteriophage Sfi21

<400> 29

Met Lys Lys Arg Lys Lys Met Ile Asn Phe Lys Leu Arg Leu Gln  $1 \hspace{1cm} 10 \hspace{1cm} 15$ 

Asn Lys Ala Thr Leu Val Ala Leu Ile Ser Ala Val Phe Leu Met Leu  $20 \hspace{1cm} 25 \hspace{1cm} 30$ 

Gln Gln Phe Gly Leu His Val Pro Asn Asn Ile Gln Gly Ile Asn Thr  $35 \hspace{1cm} 40 \hspace{1cm} 45$ 

Leu Val Gly Ile Leu Val Ile Leu Gly Ile Ile Thr Asp Pro Thr Thr  $50 \hspace{1cm} 55 \hspace{1cm} 60$ 

Lys Gly Ile Ala Asp Ser Glu Arg Ala Leu Ser Tyr Ile Gln Pro Leu 65 70 75 80

Asp Asp Lys Glu Val Tyr 85

<210> 30 <211> 96

<211> 50 <212> PRT

<213> Bacteriophage A500

<400> 30

Met Met Lys Met Glu Phe Gly Lys Glu Leu Leu Val Tyr Met Thr Phe  $1 \hspace{1cm} 15$ 

Leu Val Val Val Thr Pro Val Phe Val Gln Ala Ile Lys Lys Thr Glu
20 25 30

Leu Ile Pro Ser Lys Trp Leu Pro Thr Val Ser Ile Leu Val Gly Ala 35 40 45

Ile Leu Gly Ala Leu Ala Thr Ser Leu Asp Gly Ser Gly Ser Leu Ala 50 60

Thr Met Ile Trp Ala Gly Ala Leu Ala Gly Ala Gly Gly Thr Gly Leu 65 70 75 80

Phe Glu Gln Phe Thr Asn Arg Ala Lys Lys Tyr Gly Lys Asp Asp Lys  $85 \hspace{1cm} 90 \hspace{1cm} 95$ 

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<212> PRT

<213> Bacteriophage PL-1

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Pro Ile Thr Thr Gly Phe Thr Glu Ile Phe Lys Arg Tyr Thr Pro Ala  $20 \hspace{1.5cm} 25 \hspace{1.5cm} 30$ 

Glu Gly Lys Leu Leu Pro Val Leu Ser Ile Gly Thr Gly Ile Leu Leu 45

Ala Cys Val Trp Ala Met Ala Phe Gly His Leu Pro Leu Ile Gly Ala  $50 \hspace{1cm} 55 \hspace{1cm} 60$ 

Tyr Ala Leu Ala Gly Met Leu Ser Gly Leu Ala Ser Val Gly Val Tyr 65 70 75 80

Gln Ile Val Lys Pro Asn Glu Glu Val Lys 85 90